BRAZORIA COUNTY PARKS DEPARTMENT
PARKS SIGNAGE

HANSON RIVERSIDE COUNTY PARK, WEST COLUMBIA
CAMP MOHAWK COUNTY PARK, ALVIN
BRAZOS RIVER COUNTY PARK, PLANTERS POINT
RESOFT COUNTY PARK, ALVIN
SAN LUIS COUNTY PARK, FREEPORT
QUINTANA BEACH COUNTY PARK, QUINTANA

INDEX:

STATE OF TEXAS
RENE DAMIAN
85014
LICENSED
PROFESSIONAL ENGINEER

6.1.16

CEDNA ENGINEERING
209 East Henderson Road
Angleton, Texas 77515
979-864-3442
Texas Registration # F-10683

GENERAL NOTES FOR MASONRY

Masonry units.
Concrete masonry units shall be hollow or solid unit masonry in accordance with ASTM C 90 and shall have a minimum net area compressive strength of 1900 psi .
NOMINAL SIZE SHALL BE 8" X16" X8 THICK, 2 CORE TYPE

Mortar.
Mortar shall be either Type M or S in accordance with ASTM C 270.
Mortar joints should be constructed about 3/8 ", 1/ 4" minimum and 11/2 " maximum.

Grout.
The grout shall have a maximum coarse aggregate size of 3/8 inch placed at an 8 to 1 0-inch slump and have a minimum specified compressive strength of 3000 psi at 28 days when tested in accordance with ASTM C 1019, or shall be inaccordance with ASTM C 476. Grout shall be placed in maximum 5 foot lifts and properly consolidated.
Exception: Where the following conditions are met, place grout in lifts not exceeding 12.67 ft .
1. The masonry has cured for at least 4 hours.
2. The grout slump is maintained between 10 and 11in.
3. No intermediate reinforced bond beams are placed between the top and the bottom of the pour height.

Reinforcing steel.
The reinforcing steel shall be minimum Grade 60 and identified in accordance with ASTM A 615, A 706 or A 996.

Metal accessories.
Joint reinforcement, anchors, ties and wire fabric shall conform to the following standards:
1. ASTM A 951 for joint reinforcement and wire anchors and ties.
2. ASTM A 36/A36M for plate, headed and bent bar anchors.
3. ASTM A 1008A/A1008M for sheet metal anchors and ties.

Galvanization.
Metal accessories for use in exterior wall construction and not directly exposed to the weather shall be hot dip galvanized and metal accessories for use in interior wall construction shall be mill galvanized.

Fasteners and connectors.
A continuous load path between foundations,
walls and roofs shall be provided. Approved connectors, anchors and other fastening devices shall be installed in accordance with the manufacturer's recommendations.
Where fasteners are not otherwise specified,
fasteners shall be provided in accordance with
Table R602.3(1) of the International residential Code.
Nails, screws or bolts shall be able to resist the forces described in this standard. Nails, screws and bolts shall comply with requirements contained in the National Design Specifications for Wood Construction.
Unless otherwise stated, sizes given for nails are common wire nails. For example, 8d = 21/2 inches long 0.131-inch diameter. (See table 2, 3 and 4, in the National Design Specifications for Wood Construction).

Masonry work, general.
All mortar joints for hollow unit masonry shall
extend the full width of face shells. Mortar joints for solid masonry shall be full head and bed joints. Bed joints shall be $\frac{3}{8}$" inch (+/- $\frac{1}{8}$") thick and head joints shall be $\frac{3}{8}$"(+/- $\frac{1}{8}$"). The bed joint of the starting course placed over footings shall be permitted to vary in thickness from a minimum of $\frac{1}{4}$"to a maximum of $\frac{3}{4}$".

Masonrywalls.
Walls shall be running bond or stack bond construction. When masonry units are laid in stack bond, 9-gage horizontal joint reinforcement, in addition to required vertical reinforcement, shall be placed in bed joints at not more than 16 inches (406 mm) on center.
Longitudinal wires of joint reinforcement shall be fully embedded in mortar or grout with a minimum cover of $\frac{5}{8}$" when exposed to earth or weather and $\frac{1}{2}$ inch (13 mm) when not exposed to earth or weather.

Reinforcing steel.
Steel shall be No. 4 or No. 5, for bond beam reinforcement and No.4 or No. 5 bars for wall vertical reinforcement. Splices shall be 20" for No 4 bar and 25" for No. 5 bar. Any reinforcement required to bent shall be bent cold. The diameter of the bend measured on the inside of the bar, is not less than six-bar diameters. **Masonry cover over reinforcing steel.** Reinforcing bars embedded in grouted masonry cells shall have a minimum clear distance of 1/4 inch for fine grout or 1/2 inch for coarse grout between reinforcing bars and any face of a cell. Reinforcing bars used in masonry walls shall have a masonry cover (including grout) of not less than 1.2 inches for masonry units with face exposed to earth or weather.

Cleanout openings.
Cleanout openings shall be provided for cells containing spliced reinforcement when the grout pour exceeds 5 feet in height. Exception: Cleanout openings are not required in cells containing vertical reinforcement where footing dowels are not required, provided vertical wall reinforcement from above reaches within 12 inches of the floor slab below. Where cleanout openings are required, an opening shall be provided in the bottom course of the masonry cell to be filled. Masonry cells shall have a minimum clear distance of $\frac{1}{4}$" for fine grout or $\frac{1}{2}$" for coarse grout between reinforcing bars and any face

Masonary Wall Thickness.
The minimum thickness of exterior masonry walls shall be 8 inches

Bond Beams.
A reinforced bond beam shall be provided in
masonry walls at the top of the wall .
Bond beams shall be one of the following:
8 inches thick 8 inches high masonry .
8 inches thick12 inches high masonry .
8 inches thick16 inches high masonry .

Precast units certified by the manufacturer to be suitable for the loads installed in accordance with the manufacturer's specifications, and approved by the building official.
Reinforcement shall be continuous around corners . Where more than one bar is required, only one bar needs to be continuous around corners. All splices shall be lapped as required.
Precast bond beams shall properly receive and retain all vertical wall reinforcement. Precast bond beams shall contain the minimum amount of continuous reinforcement as noted above and shall be reinforced at joints.
Vertical wall reinforcement shall be lap spliced to foundation dowels. All vertical wall reinforcement shall be terminated in the bond beam at the roof level with a standard hook. The hook may be formed by bending the vertical wall reinforcement or by lap splicing to a standard hook. The hook shall extend to the uppermost horizontal reinforcement of the bond beam and shall be embedded a minimum of 6 inches (152 mm) into the bond beam.

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Date: 3-11-16
Drawn By: TJS
Sheet No. 1 of 8

General Notes

Site Drainage:

A majority of foundation related problems in the local area are attributable, at least in part, to poor drainage and expansive soils. Poor drainage, and the resulting ponded water, can cause high plasticity clays to swell or even induce settlement in very low plasticity silts or coarser grained materials. We recommend that an effective site drainage plan be devised away from the foundation perimeter and off the site, both during and after construction.

Site Preparation: Soft soils should be removed until firm soil is reached. The soft soils can be aerated and placed back in eight-inch loose lifts and compacted to 95% as specified by ASTM D-698. Clearing and stripping of vegetation, roots and removal of any materials containing significant organic material from the building area and areas to be paved should be performed. Soils with organics more than ten percent (10%) by volume are considered to be organic soils and can have deleterious effects. Tree stumps, tree roots, old slabs, old foundations and existing pavements should be removed from the structure area. If the tree stumps and roots are left in place, settlement and termite infestation may occur. Once a root system is removed, a void is created in the subsoil. It is recommended to fill these voids with structural fill or cement-stabilized sand and compact to 95% as specified by ASTM D-698.

Any low-lying areas including ravines, ditches, swamps, etc. should be filled with structural fill and placed in eight-inch lifts. Each lift should be compacted to 95% of the maximum dry density as specified by ASTM D-698.

The exposed subgrade should be scarified to a minimum depth of six (6) inches in the driveway and slab areas. The subgrade should then be compacted to 95% of the maximum density as determined by the Standard Moisture Density Relationship (ASTM D-698). In the event that the upper six (6) inches cannot be compacted due to excessive moisture, we recommend that these soils be excavated and removed or chemically stabilized to provide a firm base for fill placement. The exposed subgrade surface should then be proof rolled with a loaded heavy earthwork piece of machinery weighing 15 to 20 tons such as a motorized articulated scraper, maintainer or dump truck to detect soft or loose zones, followed by proper soil replacement, if necessary. Smooth-roller type equipment is suitable for proof rolling the near-surface sand. The fill soils should extend at least five feet beyond the perimeter of the structure. In addition, the floor slab should be placed as soon as possible after the building pad is prepared. If the building pad is left exposed to rainfall, perched groundwater conditions may develop which will undermine the integrity of the floor slab. All trenches (water, cable, electrical) should be properly backfilled and compacted to 95% of the maximum dry densities. Sand or permeable materials should not be used as backfill. Improperly backfilled and improperly compacted trench, if left exposed will also be another source for perched groundwater conditions. In general perched water tends to be trapped within the fill. The trapped groundwater tends to soften the subgrade. Positive drainage should be maintained across the entire building pad. A qualified soil technician should monitor all earthwork operations. Field density tests should be conducted on each lift using a nuclear density gauge. The gauge should be calibrated every day. Prior to field density tests, a 50-pound sample from the subgrade soils should be obtained. A similar sample should be obtained from the fill soils. A Standard Moisture Density Relationship (ASTM D-698) should be performed on each sample in order to obtain an optimum moisture content and a maximum dry density. The field density tests should be compared to these results every time the soils are tested in the field. The above recommendations are applicable to slabs, driveways, pavements and any structures that are supported directly on-grade.

Low Swell Potential Structural Fill:

Low swell potential select fill should consist of cohesive soils free of organics or other deleterious materials and should have a maximum liquid limit of 35, a plasticity index not less than 10 or more than 20, 20 percent should pass the No. 200 sieve and a maximum particle size of 2. Sandy clays and clayey sands are recommended for use. The low swell potential select fill should be cleaned and free of organic matter or other deleterious material. The fill should be placed in maximum 8-inch loose lifts and compacted to a minimum of 95 percent of the maximum dry density as determined by ASTM D 698 (Standard Proctor **Test**). The moisture content at the time of compaction should be at, or above the optimum value as defined by ASTM D 698. The referenced moisture content and density should be maintained until construction is complete.

Maintenance Considerations:

The site should be graded in such a manner to shed all rainwater away from the structure. Water should not be allowed to pond around the structure. Positive site drainage will reduce the exposure of the on-site clays to a moisture source thus eliminating swelling of the on-site clays. Due to the presence of sandy clay soils, it is imperative to install a watertight plumbing system. Water leakage due to poor plumbing will have detrimental effects on the performance of the structure. Roof gutters should be utilized to direct roof runoff away from the structure. Downspouts should not be allowed to discharge near the structure. Downspout extensions should be used to facilitate rapid rainwater drainage away from the structure. Trees should be planted at a distance equaling the anticipated height of the mature tree. If trees are planted in close proximity to the structure, the roots will extend below the slab area causing distress to the slab. Root barriers should be constructed around the perimeter of the building in the event that trees are located less than the maximum anticipated height of the mature tree. Root barrier should extend at least four feet below grade. The floor slabs should be provided with a moisture barrier to prevent migration of the capillary moisture through the slab. Six-mill Visqueen can be used. In addition, a two inch layer of sand can be used for leveling purposes.

Select Fill:

Any select fill material used at the site should have a maximum liquid limit of 35 percent and a plasticity index in between 10 and 20. The fill should be compacted to 95 percent of the maximum dry density as determined by ASTM D 698, within two percent below or three percent above optimum moisture content. The fill should be placed in 8 inch loose lifts (app. 6 inch compacted lifts) and compacted.

Vapor Retarder:

Provide vapor retarder including seam tape, pipe boots, and detail strips under all areas of slabs on-grade or slabs over carton forms.

Vapor retarder used under typical floor areas shall be one of the following:

1. 6 mil sheeting meeting the qualities listed below

Other products may be substituted assuming that they have the following performance based qualities. Submit a substitution request to the architect and engineer.

1. Minimum permeance per ASTM E-96, method B of 0.04 perms or less
2. Water vapor barrier per ASTM E-1745, Class A
3. Minimum thickness of 6 mils per ACI 302.1R

Follow all manufacturers instruction for installation, including the following:

1. Start vapor retarder under perimeter grade beams and then extend over subgrade.
2. Lap all edges (sides and ends) a minimum of 12" and seal continuously with manufacturer's recommended tape.
3. Repair all punctures or tears prior to concrete pour. Lap patches over these areas a minimum of 8" and tape all edges.
4. Seal all penetrations, including pipes, with a pipe boot made from the vapor barrier, fully seal all laps and joints.
5. Any electrical conduits shall be placed above the vapor barrier and shall be fully encased in concrete. Provide a minimum of 1 1/2" cover of concrete beneath the conduits. Support all conduits using plated chairs or by tying to the slab-on-grade reinforcing steel.

Concrete:

Concrete shall be normal weight (unless noted otherwise) and shall conform to ACI 318- 10, Chapter 5 requirements. Concrete work shall conform to ACI 301-99.

Minimum compression strengths at 28 days:

- All concrete, unless noted otherwise - 4000 PSI (Max 1 1/2" aggregate, uno)
- Concrete floor slabs on grade - 4000 PSI (Max 1 1/2" aggregate)
- The minimum strength of the concrete must be met before work or construction begins.

A slump test will be completed. The slump will not exceed 4 inches. Maximum water to cement ratio (W/C) of all concrete shall be 0.53 Aggregates shall meet the requirements of ACI 302.1 R-96 (chapter 5.4) and conform to the combined aggregate grading specified in section 5.4.3 (ACI 302.1 R-96). Fly ash, when used, may be substituted for portland cement in quantities not to exceed 20 percent fly ash by mass of cementious materials. Concrete trowel-finished interior concrete floors made with normal weight aggregates should not include an air-entraining admixture. Maximum trapped air content for floor concrete should be 3 percent. Horizontal construction joints are not permitted for horizontal concrete members. Unless noted otherwise on plan, all construction joints shall be made in the center of spans with vertical bulkheads. Properly consolidate all cast-in-place concrete using vibrators during placement. Vibrate all concrete including the top five feet or drilled piers, footings, grade beams, slabs, walls, columns, etc. Vibrate all concrete such that no cold joints or honeycombing (voids) are present in the finished construction. The contractor will be responsible for the cost of any structural repairs to concrete due to improper placement. The contractor must provide the engineer with proposed repair materials prior to commencement of any structural repair work, the engineer must approve in writing the proposed products. Notify the engineer for additional instructions at any conditions where structural or cosmetic repairs are necessary to exposed cast-in-place concrete (E.G. Slabs, walls, etc.)

Reinforcing Steel:

Reinforcing bars shall conform to ASTM A645-Grade 60. Smooth dowels shall conform to ASTM A36 or ASTM A306. Welded wire fabric shall conform to ASTM A185 or A497. Furnish in flat sheets only. Reinforcing steel detailing shall conform to ACI 315. Minimum laps for unscheduled bars in concrete shall be:

Vertical bars-38 bar diameter

Slab-on-grade bars- 38 bar diameter

Bottom beam horizontal bars- 38 bar diameter

Top beam horizontal bars - 50 diameter

Location of all laps must be reviewed and approved by the engineer of record. Refer to typical details on these drawings for tension development lap splice lengths. Refer to drawings for lap type (E.G. tension lap, class 'A', class 'B' etc.)If no lap type is specified for a particular condition notify engineer of record for lap type or use a class 'B' tension lap splice. For reinforcing steel in masonry walls see masonry section for minimum laps. Unless noted otherwise, top bars in horizontal beams shall be spliced at midspan and bottom bars shall be spliced at supports. Use Class 'A' tension lap splices.

Provide 90 degree bends with development length returns for continuous horizontal bars at corners of grade beams and walls. Corner bars hall be equivalent in size and spacing to horizontal reinforcement. Provide bar chairs to insure proper cover for all reinforcing. Submit chair type spacing t engineer for approval. Concrete cover:

Drilled piers - 6" bottom and 3" sides

Grade beams-1 1/2" top, 3" bottom, 2" sides (3" if earthformed)

Slab-on-grade- centered in slab (for slabs with single layer of steel) 2" cover to bottom mat and 2" cover to top mat (For slabs with two layers of steel)

Welding of reinforcing steel - ASTM A615- Grade 60 reinforcing steel shall not be welded or tack welded for any reason. A615- Grade 60 reinforcing steel may not be used at deformed bar anchors or other anchors noted on the drawings to be welded. Refer to next section for weldable reinforcing steel requirements.

Anchors:

Headed stud anchor (HSA) steel shall conform to ASTM A109-1020. Deformed bar anchor (DBA) steel shall conform to ASTM A108- Grade 70 or A708- Grade 60. Both HSA's and DBA's shall be welded to steel with automatic stud welding equipment. Welding shall conform to "Nelson stud welding system" recommendations. Expansion anchors shall be "Hilti Kwik Bolt III" or equal. Unless noted otherwise, minimum embedment should be 4 3/4" for 3/4" diameter anchors. Sleeve anchors shall be "Hilti sleeve anchors". Unless noted otherwise, minimum embedment shall be 1 1/2". Installation of expansion and sleeve anchors shall conform to the manufacturer's recommendations. Powder driven anchors (PDA's) shall be "Hilti" or equal. Installation shall conform to manufacturer's recommendations. Epoxied rebar, bolts or threaded rods shall be installed according to the "Hilti Hit System". Hy-150 type cartridges shall be used. Unless noted otherwise embed dowels a minimum of 15 bar diameters into concrete.

Groundwater Control

In general, the highest groundwater level during construction should be three (3) feet below the bottom of the excavation to ensure excavation stability. Presence of groundwater above the excavation depths may require de-watering. However, it is the contractor's responsibility to select the proper de-watering systems for the proposed constructions.

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Drawn By: TJS

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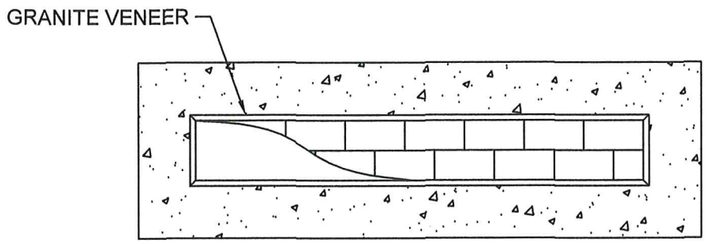
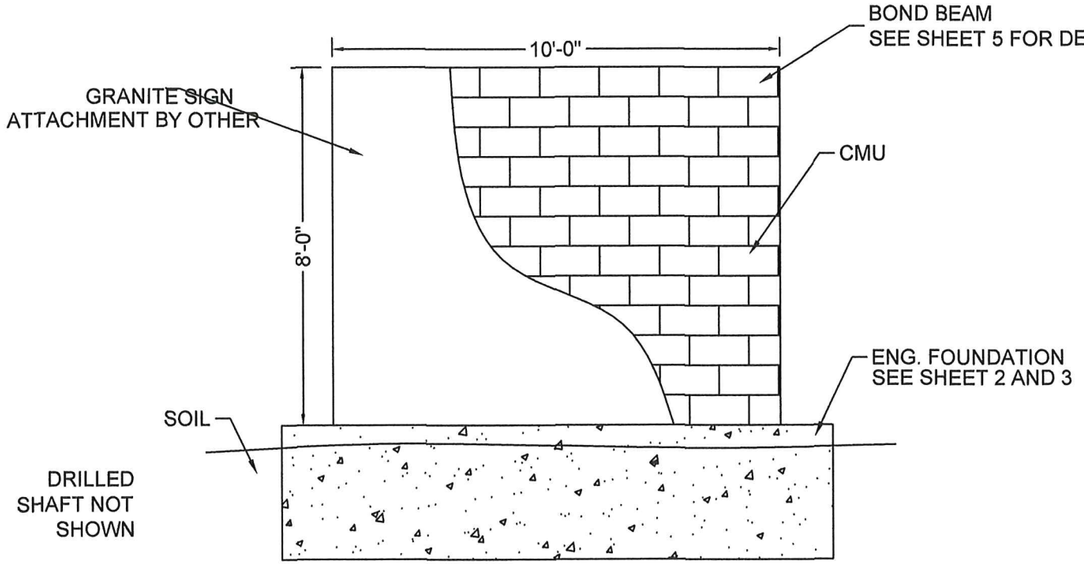


TOP VIEW

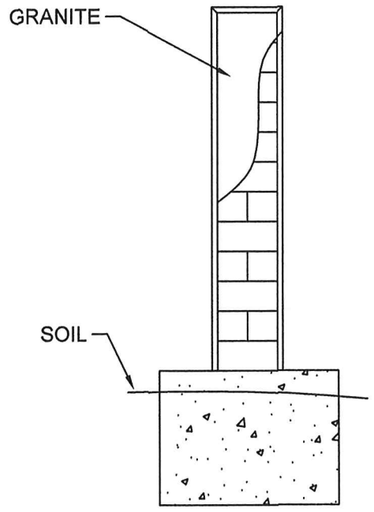
NOTES:

1. CONCRETE SHALL INCLUDE D.C.I. CORROSION INHIBITOR BY W.R. GRACE AT A RATE OF 6 GALLONS/ CUBIC YARD. ADJUST MIX WATER ACCORDINGLY AT BATCH PLANT TO ACCOUNT FOR THE WATER IN D.C.I.

2. CONCRETE TO BE 4000 PSI.



FRONT VIEW



SIDE VIEW

OPTION A- 2 SIDED

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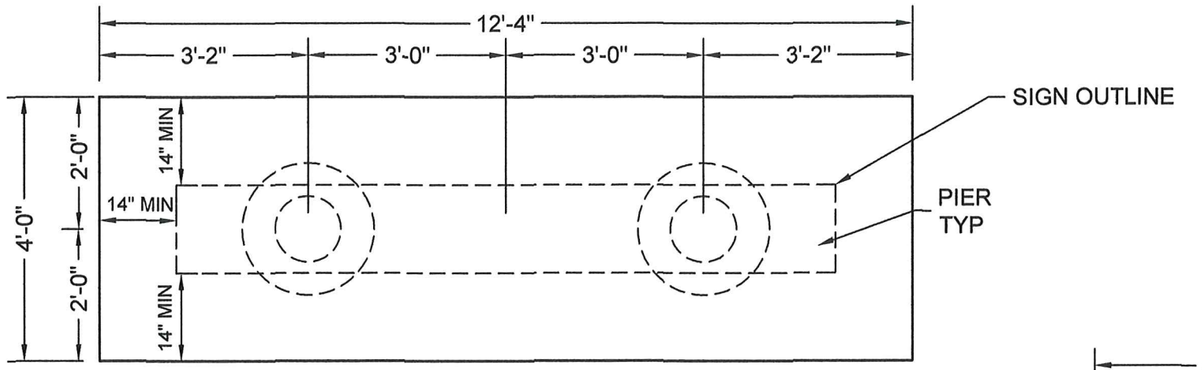
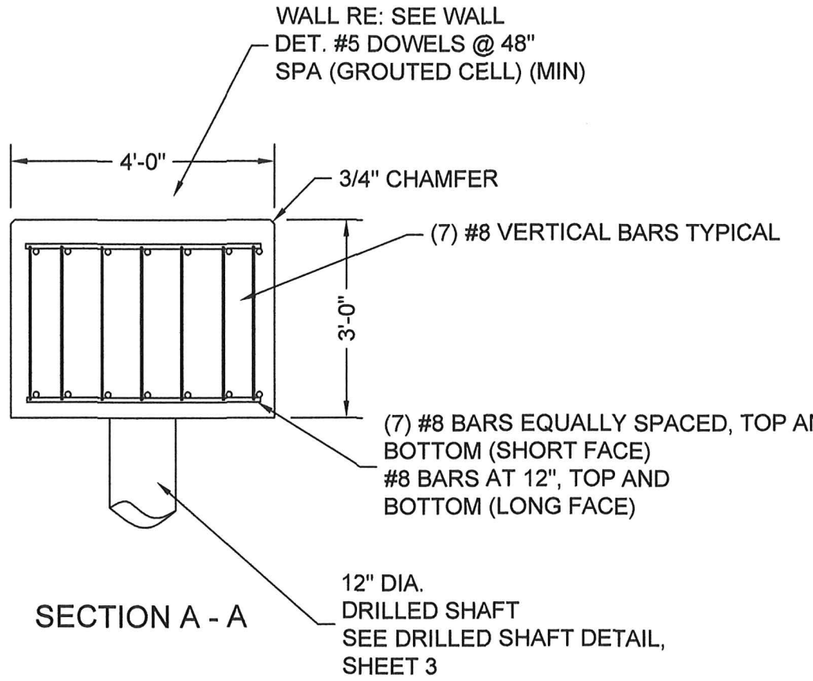
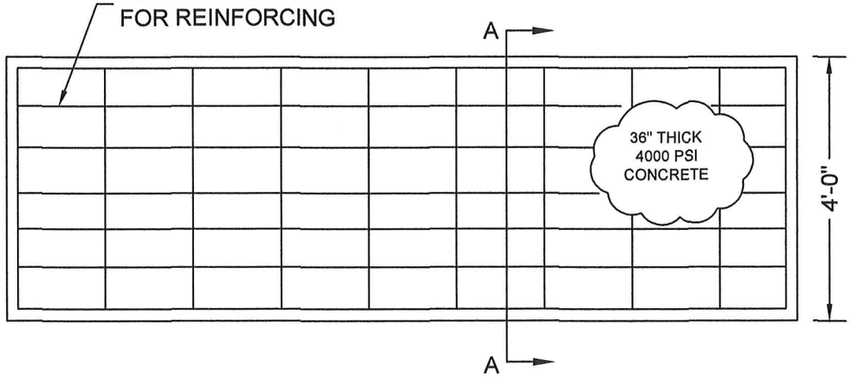


MONUMENT SIGN BASE PLAN



SECTION A - A



FOUNDATION BASE PLAN

OPTION A

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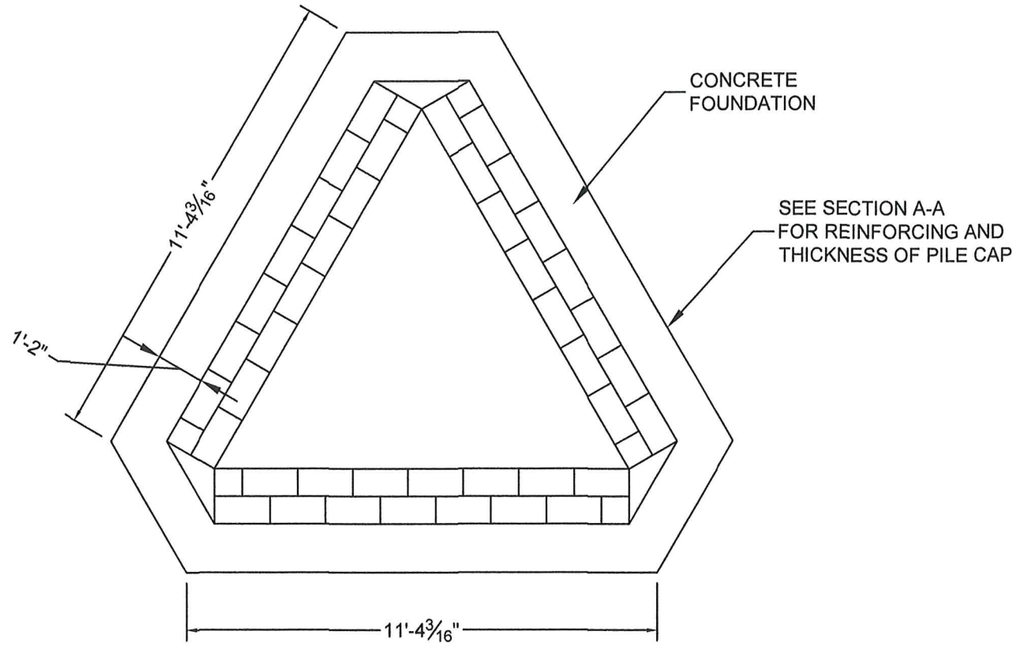

TOP VIEW

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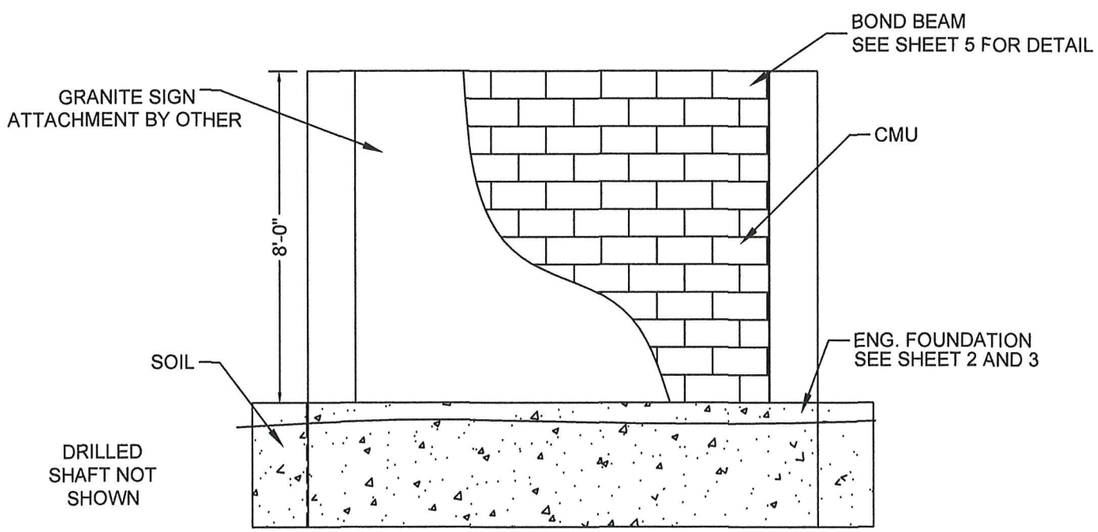
1. CONCRETE SHALL INCLUDE D.C.I. CORROSION INHIBITOR BY W.R. GRACE AT A RATE OF 6 GALLONS/ CUBIC YARD. ADJUST MIX WATER ACCORDINGLY AT BATCH PLANT TO ACCOUNT FOR THE WATER IN D.C.I.

2. CONCRETE TO BE 4000 PSI.



FRONT VIEW

OPTION B- 3 SIDED

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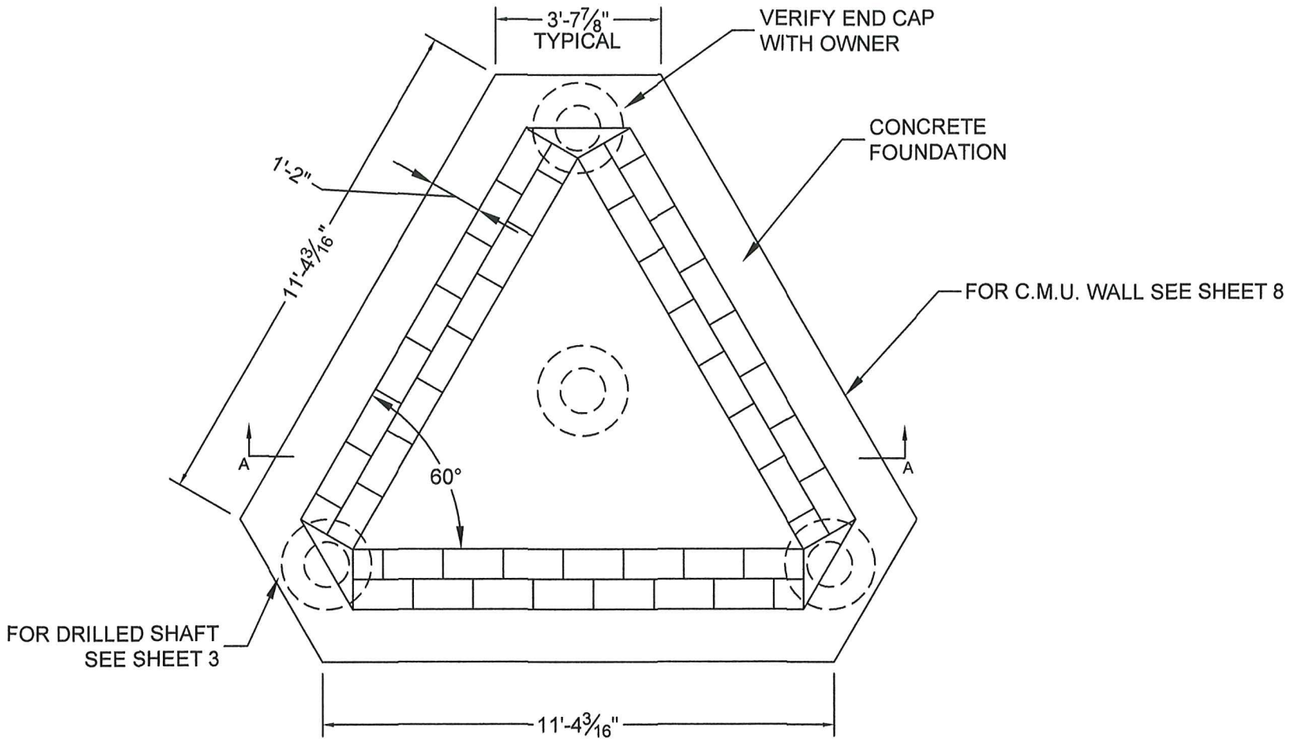
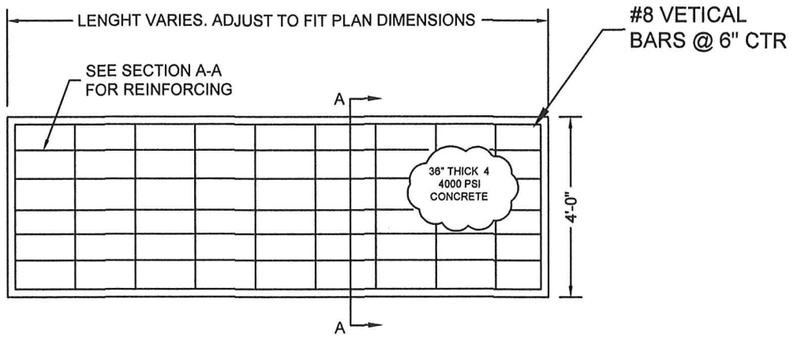


TOP VIEW



#8 BARS @ 6" CTR (MAXIMUM) TOP & BOTTOM EACH WAY REBAR LENGTHS WILL VARY. MAINTAIN 3" CLEAR FROM EDGE OF CONCRETE.

FOUNDATION BASE PLAN

SECTION A-A (C.M.U. WALL NOT SHOWN FOR CLARITY) THIS SHEET

OPTION B

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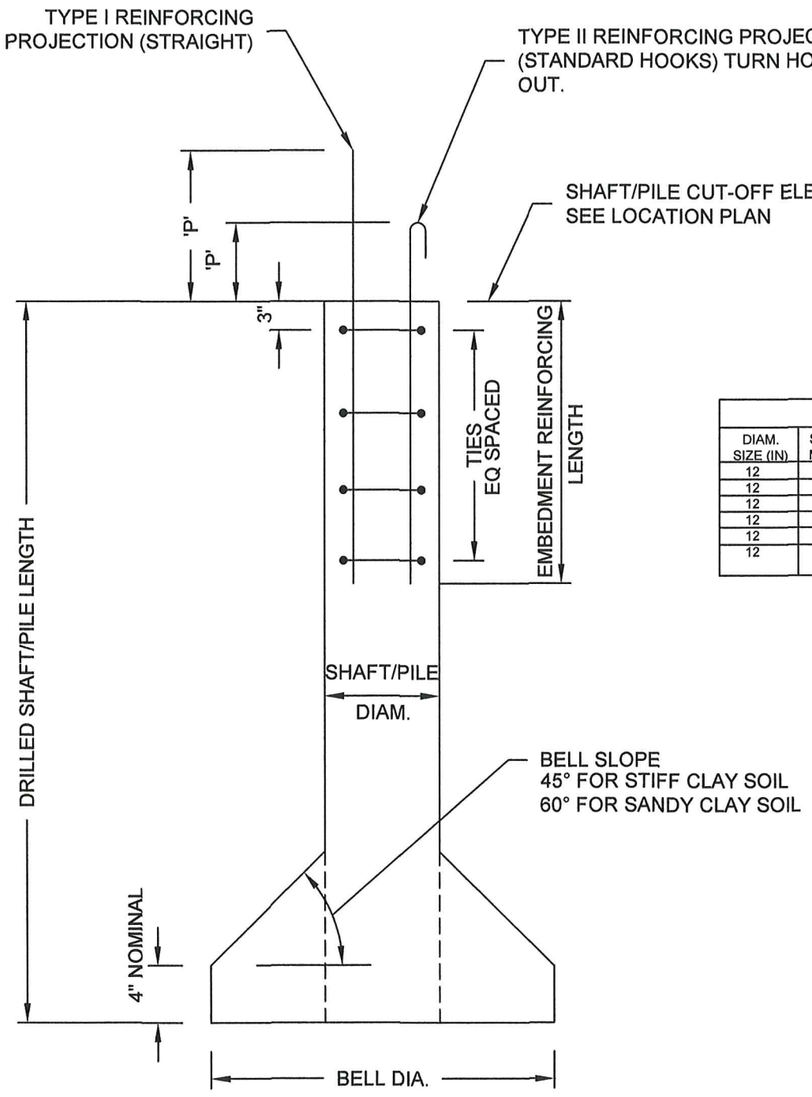


TYPICAL SECTION DRILLED SHAFT

PLAN CHANGES

1. ALL FASTENERS TO BE CORROSION RESISTANT PER TEXAS REVISIONS.
2. ALL HOLDOWNS TO BE SIMPSON STHD14 OR EQUAL.U.N.O.
3. ALL SHEARWALLS SHALL EXTEND TO ROOF DECK INCLUDING THOSE ON PORCHES.

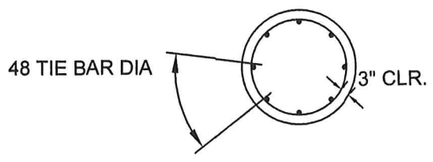
DRILLED SHAFT/ PILE REINFORCING SCHEDULE

DIAM. SIZE (IN)	SHAFT MARK	VERTICAL REINFORCING				HORIZONTAL TIES		REMARKS	GEOTECHNICAL REPORT #
		No.	SIZE	EMBEDMENT	PROJ. 'P'	SIZE	SPACING		
12	A	4	5	11.5 FT	21 IN	4	6 IN	HANSON RIVERSIDE COUNTY PARK, WEST COLUMBIA	G16-140
12	B	4	5	13.5 FT	21 IN	4	6 IN	CAMP MOHAWK COUNTY PARK, ALVIN	G16-135
12	C	4	5	11.5 FT	21 IN	4	6 IN	BRAZOS RIVER COUNTY PARK, PLANTERS POINT	G16-139
12	D	4	5	14.5 FT	21 IN	4	6 IN	RESOFT COUNTY PARK, ALVIN	G16-138
12	E	4	5	12.5 FT	21 IN	4	6 IN	SAN LUIS COUNTY PARK, FREEPORT	G16-137
12	F	4	5	11.5 FT	21 IN	4	6 IN	QUINTANA BEACH COUNTY PARK, QUINTANA	G16-136

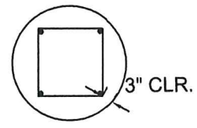
DRILLED SHAFT/PILE SCHEDULE

SHAFT/PILE MARK	NO. OF PILES	SHAFT/BELL DIA. (IN.)	CUT-OFF ELEV. (FT.)	BOTTOM ELEV. (FT.)	SHAFT LENGTH (FT.)	REINF. MARK
A	3	12/36	*	-	12.5	A
B	3	12/36	*	-	14.5	B
C	3	12/36	*	-	12.5	C
D	3	12/36	*	-	15.5	D
E	3	12/36	*	-	13.5	E
F	3	12/36	*	-	12.5	F

* DRILLED SHAFT CUT-OFF ELEV. TO BE 2' BELOW EXISTING GRADE. FIELD VERIFY PRIOR TO INSTALLING SHAFT. CONFIRM SOIL CONDITIONS WITH ENGINEER.



CIRCULAR TIES
(NORMAL CASE)



SQUARE TIES
(OPTIONAL TIE FOR 4 BAR SHAFTS)

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PROFESSIONAL ENGINEER

6.1.16

CEDNA ENGINEERING
209 East Henderson Road
Angleton, Texas 77515
979-864-3442
Texas Registration # F-10683

BRAZORIA COUNTY
PARKS SIGN

Date: 3-11-16
Drawn By: TJS
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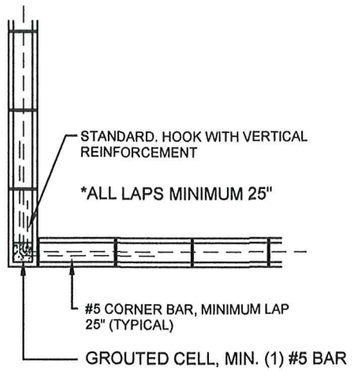
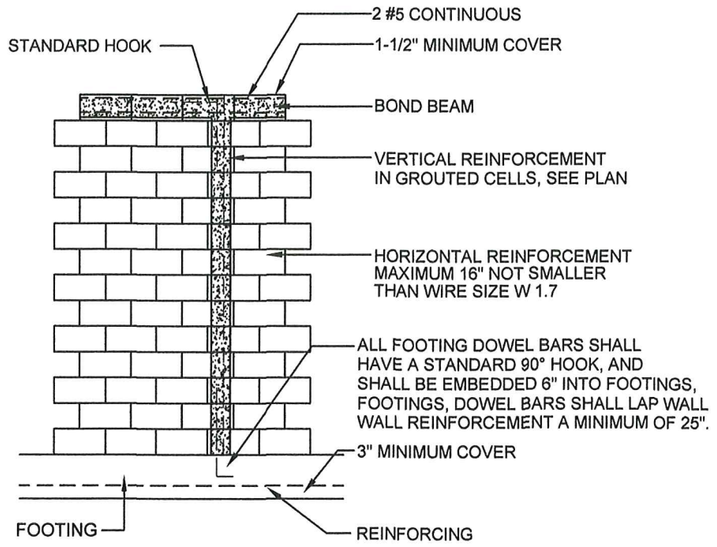
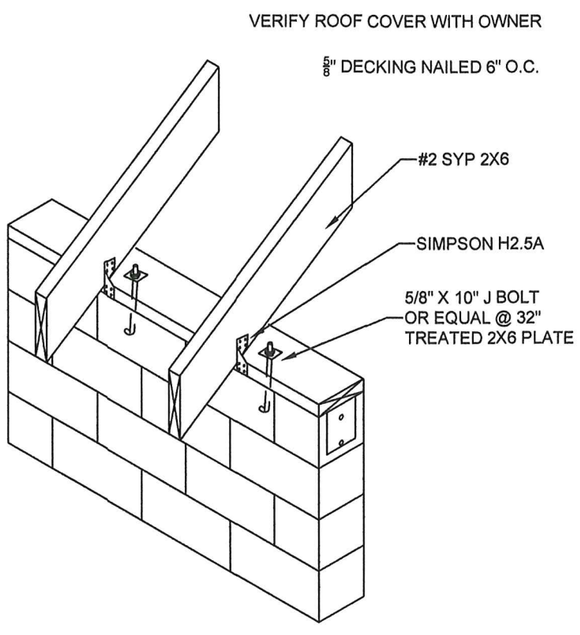


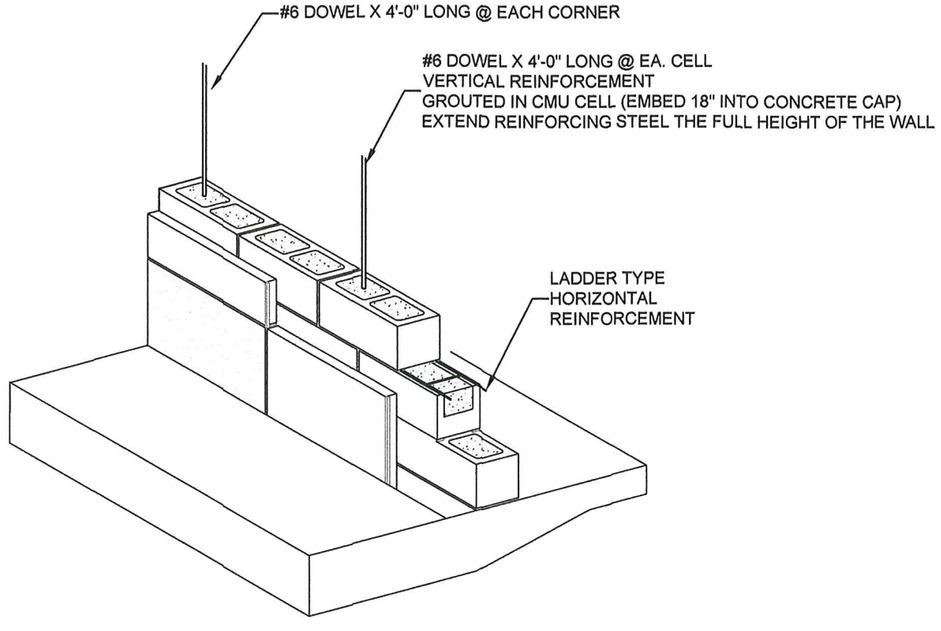
CORNER CONTINUITY OF BOND BEAM AND WALL REINFORCEMENT



ONE-STORY CONCRETE OR MASONRY WALL



OPTIONAL ROOF FRAME



WALL DETAIL

STATE OF TEXAS
RENE DAMIAN
85014
LICENSED PROFESSIONAL ENGINEER

6.1.16

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